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09/659,431	09/08/2000	Srinath Hosur	TI-29648	4265
23494	7590	06/28/2006	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			WANG, TED M	
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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/659,431
Filing Date: September 08, 2000
Appellant(s): HOSUR ET AL.

Carlton H. Hoel
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 10, 2006 appealing from the Office action mailed January 10, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Prior Art of Record

US 5,999,131	Sullivan	Feb. 13, 2001
US 5,937,333	Sexton et al.	Apr. 03, 2002

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Sullivan (US 5,999,131).

- With regard claim 1, Sullivan discloses a method of multipath combining, comprising:

- (a) forming at least one matrix of covariances of multipath inputs (column 6, lines 6-14) from a single receiver antenna (Fig.2 element 22 and column 5, lines 58-60);

- (b) finding an eigenvector of said matrix (column 6, lines 12-20); and

- (c) combining said multipath inputs (Fig.2 element 24 and column 5 lines 46-49) relatively weighted according to the components of said eigenvector (column 6 lines 6-20).

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- With regard claim 2, Sullivan further discloses wherein (a) said eigenvector is associated with a maximal eigenvalue of said matrix (column 3 lines 30-38).

(11) Response to Argument

Independent Claim 1

1. Applicants' argument – “Appellants reply that “antenna element” in Sullivan is not a single antenna as required by claim 1, but rather multiple antennas. In particular, Fig.2 shows three antennas (22a, 22b, 22c) feeding beamformer 24, and column 5, lines 41-51 refer to Fig.2 as showing a base station site which 11... includes an antenna element 22, beamformer 24 ...”. Furthermore, a beamformer must have more than one antenna input/output in order to form a beam or to make directional detection as in column 5, lines 46-49. Similarly, column 6, lines 27-30 notes the direct path direction used as isolating the direct path component 20a from the other multipath components of signal 20. That is, the detection and ranging in Sullivan cannot work with only a single antenna. Consequently, Sullivan does not suggest the claim 1 requirement of a single receiver antenna, and claim 1 plus its dependent claim 2 are patentable over Sullivan.” as recited. In summary, applicant argued that

(a) “antenna element” in Sullivan is not a single antenna as required by claim 1, but rather multiple antennas; and

(b) a beamformer must have more than one antenna input/output in order to form a beam or to make directional detection.

Examiner's response – In response to applicant's argument as described above, Examiner cites the Sullivan's reference (US 5,999,131), column 5 lines 41-65, for argument **(a)** and cites Sexton's reference (US 5,937,333) to explain a single antenna is capable of providing a beamforming operation for argument **(b)**.

With regard argument **(a)**, Sullivan teaches "as far as **antenna element 22** is concerned, it will be appreciated that **a single element** can be used, **or an array** can be used which **includes several antenna elements 22**" (column 5 lines 58-60). The appellants apparently argue that "a single element" or "each antenna element" taught by Sullivan should be interpreted as "multiple antennas". The Examiner respectfully disagrees. On column 7, lines 38-41, Sullivan clearly teaches -

"A wireless system for determining the location of a signal emitter which comprises:

at least three mutually dispersed base station sites, each said base station site having **at least one antenna** for receiving said emitter signal."

Therefore, "a single element" should be interpreted as a single antenna. Further, if "a single element" were to be interpreted as "multiple antennas" as argued by the appellants, the single element would form an array of antennas. Then, the disclosure of "... or an array can be used which includes several antenna elements 22" (column 5 lines 58-60) would be redundant because several antenna elements still form an array of antennas only. The antennas 22a, 22b, 22c in Fig.2 of Sullivan's reference are clearly used to illustrate the disclosure of several antenna elements.

With respect to argument **(b)**, a beamformer may need more than one antenna input/output in order to form the beamformer, but it does not necessarily mean that multiple antennas are needed. The examiner hereby presents a side reference, Sexton (US 5,937,333), to support the Examiner's point. Note that the Sexton's reference is not used as rejection basis.

Sexton teaches at least one antenna coupled to the at least one receiver, the at least one antenna providing reception utilizing both a beamforming technique and an omni-directional technique (Fig.1 and 2 element 118, column 2 lines 3-5 and column 2 lines 26-29). It is clear from the teaching of Sexton that **a single antenna is capable of providing a beamforming operation.**

(12) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Patent Examiner
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TW
May 12, 2006

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